Original Article

Examining health status of women in rural, peri-urban and urban areas in Jamaica

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Abstract

Background: A comprehensive review of the literature revealed that less information is available in literature on health status of women, and health status of women in 3 geographical zones in Jamaica. **Aims**: This study examined data on the health status of women in Jamaica in order to provide some scientific explanation of those factors that account for their health status; and differences based on area of residence. **Materials and Methods:** The sub-sample for the current study was 8,541 women ages of 15 and 100 years extracted from a national survey of 25,018 respondents. Stratified random sampling technique was used to draw the sample. Data were stored, retrieved and analyzed using SPSS 16.0. Descriptive statistics were used to provide background information on the subsample, and logistic regressions were utilized to model health statuses. **Results**: Rural women had the lowest health status (OR = 0.819, 95% CI = 0.679-0.989) among all women (peri-urban OR = 1.054, 95% CI = 0.842-1.320; urban OR = 1.00) and that they were the least likely to have health insurance coverage. Health insurance was the critical predictor of good health status of women in Jamaica, and this was equally the same across the 3 geographic areas; and that married women were 1.3 times more likely (OR 1.3, 95 CI = 1.036-1.501) to report good health compared to those who were never married. **Conclusion**: This study provides an understanding of women's health status in Jamaica as well as the disparity which correlates based on the different geographical regions.

Keywords: Health, health status; women; rural; peri-urban; urban area; determinants, Jamaica.

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Introduction

Latin America and the Caribbean have the second highest urbanization level in the world. For every 13 persons there are in the region, 10 of them live in cities (78.3% in 2007) [1]; and 20 of the region's largest cities are home to nearly 20% of its population. Jamaica is a predominantly Afro-Caribbean society, 75% black and 13% mixed, with a class structure based on land and wealth rather than race. Although a developing country, it possesses features of a developed country. While there is much industrialization and modernization, customs, cultural and social habits of several centuries are common-place.

Jamaica is the third largest English speaking Caribbean island (total area of 10,991 km²) with an estimated population of 2.7 million (2007). The country is classified into three geographical planes (Cornwall, Middlesex and Surrey) and has 14 parishes. Cornwall covers the Western belt which includes parishes such as Westmoreland, Hanover, St. James, St. Elizabeth. Middlesex constitutes the middle proportions of the island with parishes such as Clarendon and St. Catherine. Surrey comprises the Eastern region with parishes such as Kingston, St. Thomas and Portland. Another classification is cities (urban areas) which constitute 27.3% of the population, peri-urban 30.2% and rural areas, 42.5% in 2007.

In 2007, Jamaica's poverty rate was 9.9%, and this was 15.3% in rural areas, 4.0% in peri-urban areas and 6.2% in urban areas. Furthermore, the mean annual per capita

consumption for country was US $2,059.91 while it was US $2,736.60 for urban dwellers, US $2,231.04 and US $1,513.17 for rural Jamaicans. Statistics for the same period showed that the sex ratio of the population was 97 per 100 and 84 per 100 for older ages (60 years and over). This indicates that there are marginally less men than women in the population, and an even greater feminization at older ages. It was estimated that 10.9% of the population was 60 years and over which indicates an ageing population that began in the 1960s [2-4], 28.3% under 15 years, and 53.5% in the reproductive years of 15 to 49 years. Women comprised 50.7% of the population and elderly women accounted for 13.0% compared with 11.4% for elderly men. It was also found that 46.6% of household heads were women; life expectancy at birth for women was 77.1 years (2002 to 2004). The unemployment rate in 2007 was 65.4% for women [3-5] with women participation rate being 55.4% compared to 72.9% for men. Fifty-three percent of women in the poorest quintile were heads of households compared to 46.9% of men. An important difference between the sexes was the mean annual per capita consumption. Statistics revealed that the mean annual consumption for male headed-household was US $2,188.03 compared to US $1,892.92 for female headed-household.

It is well established that health status is determined by socio-physiological factors (age, income, education, culturalization, crime and negative psychology) and that lifestyle practices also account for good (or poor) health status [6-8]. Women's health therefore is intricately a mix of socio-physiological response or outlay and is expressed through behavior relating to culture, religion, and legal norms [6]. Although recent attention has been directed towards exploring the ramifications of women's health in the Western Hemisphere including the Caribbean, an extensive review of the literature revealed that only a few studies have examined health determinants of women in the Caribbean, including Jamaica [7, 8].

Using secondary data from a stratified probability survey on political culture of 1,338 respondents, Bourne [7] extracted a sample of 722 women in investigating the determinants of quality of life of women in Jamaica. The study showed that the mean quality of life of Jamaican women was moderately high (6.8 out of 10; SD =1.7). Six variables (social class, employment, income, religiosity, governance of the nation and interpersonal trust) accounted for 18.5% of the variability of quality of life. Eldermire [8] investigated the general life situation of elderly Jamaican women and found that their life situations were on an average good.

Many economic indicators showed that women are disadvantaged in Jamaica and the wider Caribbean when compared to men [9-11]. In 2007, Statistics for Jamaica showed that the mean consumption per capita on food was US $2,378.39 for male head-household compared to US $1,898.56 for women. Studies have showed that women seek more health care then men [12-14], and that this commences in earlier childhood. Therefore, the similarities

and dissimilarities based on area of residence of women was examined (via econometric models) in order to determine the composition of women's health status.

Econometric models such as Bourne's health determinant model [15] denotes that an individual's health is a function of cost of medical care and other factors such as: educational level, age, the environment, gender, marital status, area of residence, psychological status which include positive and negative affective status, occupancy per room, home tenure, property, and crime and victimization. Bourne's work modeled health determinants of Jamaicans, and with the aforementioned issues surrounding women as were outlined above, a study on Jamaicans is not necessarily providing an understanding of women's health and significant of particular factors determining their health status or the disparity in health status of women based on the 3 geographic sub-regions in the island. This study sought to examine 1) the consumption expenditure of women in the different income quintiles (or social classes); 2) health insurance coverage, and visits to health care facilities by area of residence; 3) health status by age cohorts (i.e. young, other adults and elderly women); 4) diagnosed illness by age cohorts; diagnosed illness by area of residence; 5) the health status of women in Jamaica using a modification of Bourne's health determinant model; 6) the health status of women in and sub-regions namely urban, peri-urban and rural residence; and 7) the strength of those factors which affect health status of women in the nation and the sub-regions.

Materials and Methods

The sub-sample for the current study was all 8,541 women (ages of 15 to 100 years) extracted from a nationally representative cross-sectional survey of 25,018 Jamaicans, the Jamaica Survey of Living Status (JSLC, 2002) [16]. This survey was drawn using stratified random sampling. The design was two-stage stratified random sampling, where there was a Primary Sampling Unit (PSU) and a selection of dwelling from the primary units. The PSU is an Enumeration District (ED), which constitutes a minimum of 100 dwellings in rural areas and 150 in urban areas. An ED is an independent geographic unit that shares a common boundary. This means that the country was grouped into strata of equal size based on dwellings (EDs). Based on the PSUs, a listing of all the dwellings was made and this became the sampling frame from which a master sample of dwelling was compiled which provided the sampling frame for the labor force. Ten percent was selected for the JSLC. The survey was weighted to represent the population of Jamaica.

This study used JSLC 2002 which was conducted by the Statistical Institute of Jamaica (STATIN) and Planning Institute of Jamaica (PIOJ) between June and October 2002. The researchers selected this survey because it was the second largest sample size for the survey in its history (since 1988 to 1998), and in that year, the survey had questions on crime and victimization, and the physical

environment unlike previous years. A self-administered questionnaire was used to collect the data, which was stored and analyzed using SPSS for Windows 16.0. The questionnaire was modeled from the World Bank's Living Standards Measurement Study (LSMS) household survey. There were some modifications to the LSMS as JSLC was more focused on policy impacts. The questionnaire covered questions such as: socio-demographic, economic and wealth, crime and victimization, social welfare, health status and services, nutrition, housing, immunization of infants and physical environment. The survey was weighted in order for it to represent the population. The non-response rate for the survey was 27.7%.

Descriptive statistics such as mean, standard deviation (SD), frequency and percentage were used to analyze the socio-demographic characteristics of the sample. Chi-square was used to examine association between non-metric variables; an Analysis of Variance (ANOVA) was used to evaluate the relationships between metric and non-dichotomous categorical variables. Logistic regression examined the relationship between the dependent variable and some predisposed independent (explanatory) variables because the dependent variable was a binary one (self-reported health status, with 1 if good health status was reported and 0 if poor health).

Results were presented using unstandardized B-coefficients, Wald statistics, odds ratio and confidence interval (95% CI). The predictive power of the model was tested using Omnibus Test of Model and Hosmer and Lemeshow [17] was used to examine goodness of fit of the model. The correlation matrix was examined in order to ascertain whether autocorrelation (or multi-collinearity) existed between variables. Based on Cohen and Holliday [18], correlation can be low (weak), from 0 to 0.39; moderate, 0.4 to 0.69, and strong, 0.7 to 1.0. This was used to exclude (or allow) a variable in the model as any variable that had at least moderate correlation was excluded from the final model. Wald statistics was used to determine the magnitude (or contribution) of each statistically significant variables in comparison with the others, and the odds ratio (OR) for interpreting each significant variables.

Multivariate regression framework [19, 20] was used to assess the relative importance of various demographic, socio-economic characteristics, physical environment and psychological characteristics in determining the health status of women in Jamaica. This approach allowed for the analysis of a number of variables simultaneously. Secondly, the dependent variable is a binary dichotomous one which has enabled the use of this statistic technique to be utilized in the past to do similar studies. Having identified determinants of health status from previous studies, using logistic regression techniques, final models were build for women in general as well as for each geographical sub-regions (rural, peri-urban and urban areas) using only those predictors that independently predict the outcome. The level of significance for this study is 95% (i.e. $P <$ 0.05).

Equation 1 is a modification of Bourne [21, 22] health determinant model which was previously used to determine the health status of the elderly in Jamaica.

$$H_i = f(W_i, HH_i, Pmc_i, C_i, MR_i, AR_i, ED_i, SS_i, CR_i, (\textstyle\sum NA_i, PA_i), M_i, F_i, CH_i, A_t, A_i, HI_i, LL_i, En_i, Y_i, V_i, \varepsilon_i) \qquad (1)$$

The health status of person i, H_i, is a function of W_i, the two wealthiest quintiles of person i with 1 if yes or 0 for the two poorest quintiles; HH_i, household head of person i, with 1 if yes or 0 if otherwise; Pmc_i, cost of medical care of person i, in United States (US) dollars; C_i, average consumption per person in household, in US dollars; MR_i, is marital status of person i; AR_i, area of residence of person i; ED_i, educational level of person i; SS_i, having social support of person i with 1 if yes or 0 if no; CR_i, crowding of person i, in numbers; $(\sum NA_i, PA_i)$, psychological status which is the summation of negative affective status of person i, NA_i where values are in continuous number; PA_i, positive affective psychological status of person i, where values are in continuous numbers; M_i, number of men in household of person i; F_i, number of women in household of person i; CH_i, number of children below the age of 14 years of person i; A_t, asset owned of person i, in continuous numbers; A_i, age of person i, in continuous numbers; HI_i, of private health insurance (proxy); LL_i, living arrangement where 1 is living with family members or relative, 0 if otherwise; En_i, physical environment of person i, with 1 if affected by flood, landslides, soil erosion or 0 if not affected; Y_i, average income per person in household (this variable is proxied by total expenditure); V_i, crime of person i, where values are continuous numbers, and ε_i is the residual error.

Measures
Self-reported health status is self-assessed illness (cold, diarrhea, asthma attack, hypertension, diabetes mellitus or any other illnesses) reported by respondents in the last 4-weeks of the survey period. Good health status is a dummy variable; where 1 is good health (not reporting an ailment, injury or dysfunction) and 0 is poor health (self-reported illness, injury or ailment).

Household crowding is the average number of persons living in a room excluding kitchen, bathroom and verandah. Physical environment is the summation of responses reported by respondents on suffering landsides; property damage due to rains, flooding; or soil erosion in the last 4-weeks.

Psychological conditions are the psychological state of an individual, and this is sub-divided into positive and negative affective psychological status. Positive affective psychological status refers to the number of responses that are hopeful and optimistic about the future and life generally. Negative affective psychological status refers to the number of adverse events occurred to the respondents over the last 4-week period. Each event was equally weighted.

Age is the number of years lived, which is also referred to age at last birthday. This is a continuous variable, ranging from 15 to 100 years. Age group is classified into three sub-groups. Young are ages 15 to 30 years, other adults 31 to 59 years, and elderly 60 years and over.   Age is used as a continuous variable for the logistic regressions.

Crime and victimization index (crime index) measures the number of cases and severity of crimes committed against a person or his/her family members but not against property.

Social support (or network) denote different social networks with which the individual has or is involved (1= membership of and/or visits to civic organizations or having friends that visit ones home or with whom one is able to network, 0 = otherwise).

Living arrangement denotes whether the individual is living alone or with family, friends or associates; where 1 = living with family members or relatives, and 0 = otherwise.

Results

Demographic characteristics of sampled population
The sub-sample consisted of 8,541 respondents (ages 15 to 100 years), with a mean age of 40.1 years (SD 19.29 years). Of the sub-sample of respondents, 65.2% were never married, 24.7% married and 10.1% divorced, separated or widowed. The mean annual consumption per person per household was US$762.35 (SD US$917.81) (rate in 2002: 1US$ = JA$50.97) with the maximum consumption being US$136,822.08. Moreover, 36.6% of the sample was in poverty with 17.5% being below the poverty line (i.e. poorest poor) compared to 44% who were in the two wealthiest quintiles, of which 23% were in the wealthiest quintile (Table 1).

On examination of area of residence by age group, it was found that 21% of rural women were 60+ years compared to 15.2% of peri-urban women and15.1% of urban women (Table 1) – $P < 0.001$.

Of the population, 17.2% reported poor health status (suffering from an illness, ailment, or injuries) in a 4-week period of the survey, with 82.8% indicated good health status. Of the 17.2% of women who reported poor health status, 6.5% visited public-private health care facilities for treatment. Of this 6.5%, 6.3% visited public health care institutions compared to 0.2% who visited private health care facilities, 66.1% of those who had reported an illness in the 4-week survey period bought the prescribed medication, with 40.9% of them took the medication in full.   Some 5.6% of the sample reported that they resided alone (living arrangement), and 57.8% indicated no social support.

Based on Table 1, there was a significant statistical correlation between good health status and area of residences – $P < 0.001$. Rural women recorded the lowest health status among all women of the three geographic areas (Table 1): Rural women recorded the least good health status (75.5%) compared to 77.0% of urban women and 81.8% of semi-urban women.

More crowding was in the rural sample (1.9 ± 1.3 persons per room) compared to 1.8±1.3 persons per room in peri-urban and urban areas – $P = 0.020$. A statistical difference was found between area of residences and mean number of visits made to health care facilities – $P = 0.023$: 1.6 ± 1.1 days for rural women; 1.7 ± 1.3 days for peri-urban women and 2.0 ± 2.7 days for urban women. A statistical correlation was found between social standing and area of residences – $P < 0.001$: 22.3% of rural women were in the poorest 20% compared to 11.5% of peri-urban women and 9.5% of urban women. Rural women had the most of primary or below level education respondents (23.5%) compared to 18.4% of peri-urban and 14.6% urban – $P < 0.001$. Concomitantly, mean income of rural women was US$ 2,871.86 ± US$2,646.39 which was 76.1% of the income of peri-urban women and 64.5% of that of urban women ($P < 0.001$).

The general positive affective psychological condition of Jamaican women was moderate (3.5 out of 6 ± 2.4) and negative affective psychological condition of the same sample was low (4.6 out of 15 ± 3.4). On disaggregating both affective conditions by area of residences revealed a significant statistical difference: positive – F statistic =36.205; P < 0.001 and negative – F statistic = 30.774, P < 0.001. Based on Table 1, rural women had the highest negative affective psychological conditions – 4.8 out of 15 ± 3.2 compared to peri-urban (4.2 out of 15 ± 3.5) and urban women (4.3 out of 15 ± 3.8). However, there was no statistical difference between the negative affective psychological conditions of peri-urban and urban women (P = 0.655). Rural women had a lower mean score in positive psychological conditions (3.3 out of 6 ± 2.4) than peri-urban women (3.9 out of 6 ± 2.3) – P < 0.001; however there was no significant statistical difference between rural and urban women's positive affective psychological conditions (3.4 out of 6 ± 2.4) – P = 0.990.

Upon examination of consumption and per capita income quintile (social standing), a significant statistical difference was found between consumption of women in different social standing F = US$22.32, *P*< 0.001 (Table 2). Those in the poorest quintile had a mean consumption per person per household of Jamaican US$225.38   (rate in 2002:1US$ = Ja$50.97) which was 67% less than those in quintile 2; 133% less than those in quintile 3; 237% less than quintile 4 and 659% less than those in the wealthiest quintile (quintile 5).   Those in the wealthiest quintile had an average consumption per person per household of 125% more than those respondents in the wealthy quintile (quintile 4).   Owing to the wide disparity in values, the best measure for average consumption per person per household is the median consumption –US$554.39 (rate in 2002: 1US$ = JA$50.97).

There was no statistical difference between visits to either

public or private health care facilities and area of residence of the sample (Table 3, $P > 0.05$). However, a statistical

difference existed between health insurance coverage and

Table 1 Demographic characteristics of sample.

Variable	Rural areas n (%)	Peri-urban n (%)	Urban n (%)	P
	n = 4,962	n = 2,283	n = 1,296	
Marital status				< 0.001
Married	1232 (25.7)	568 (25.7)	243 (19.3)	
Never married	3032 (63.3)	1451 (65.7)	907 (71.9)	
Divorced	25 (0.5)	16 (0.7)	18 (1.4)	
Separated	51 (1.1)	27 (1.2)	22 (1.7)	
Widowed	453 (9.5)	147 (6.7)	71 (5.6)	
Social Standing				<0.001
Poorest 20%	1106 (22.3)	263 (11.5)	123 (9.5)	
Poor	1162 (23.4)	320 (14.0)	149 (11.5)	
Middle	1014 (20.4)	433 (19.0)	222 (17.1)	
Wealthy	973 (19.6)	522 (22.9)	321 (24.8)	
Wealthiest 20%	707 (14.2)	745 (32.6)	481 (37.1)	
Good Health status				<0.001
No	1184 (24.5)	405 (18.2)	292 (23.0)	
Yes	3641 (75.5)	1820 (81.8)	979 (77.0)	
Educational level				< 0.001
Primary and below	1010 (23.5)	355 (18.4)	159 (14.6)	
Secondary	3099 (72.0)	1360 (70.4)	807 (74.0)	
University	194 (4.5)	216 (11.2)	125 (11.5)	
Social support				< 0.001
No	2724 (54.9)	1418 (62.1)	741 (57.2)	
Yes	2238 (45.1)	865 (37.9)	555 (42.8)	
Living arrangement				0.005
With family or relative	4714 (95.0)	2148 (94.1)	1202 (92.7)	
Without family (alone)	248 (5.0)	135 (5.9)	94 (7.3)	
Age group				< 0.001
Young (15 – 30 years)	1865 (37.6)	910 (39.9)	501 (38.7)	
Older adults (31 – 59 years)	2055 (41.4)	1025 (44.9)	599 (46.2)	
Elderly (60+ years)	1042 (21.0)	348 (15.2)	196 (15.1)	
Age				
Mean (SD)	41.02 yrs (20.06)	38.65 yrs (18.19)	39.12yrs(17.91)	< 0.001
Crowding				
Mean (SD)	1.9 (1.3 persons)	1.8 (1.3 persons)	1.8 (1.2persons)	0.020
Mean Income/person (SD)	US 2871.86 (US $2646.39)	US$3773.41 (US $2752.03)	US$4451.23 (US 5181.68)	< 0.001
Mean consumption/person (SD)	US $614.04 (US $871.47)	US$888.24 (US $727.32)	US$1108.34 (US 1217.18)	< 0.001
Mean number of visits for health care (SD)	1.6days (1.1)	1.7days (1.3)	2.0 (2.7)	0.023
Negative affective				
Mean (SD)	4.8 ± 3.2	4.2 ± 3.5	4.3 ± 3.8	< 0.001
Positive affective				
Mean (SD)	3.3 ± 2.4	3.9 ± 2.3	3.4 ± 2.4	< 0.001

* Rate in 2002 was US$ 1= JA. $50.97; the recorded p-value is for each variable by area of residence (i.e. rural, peri-urban and urban).

area of residents in Jamaica ($\chi^2 = 24.4$, $P < 0.001$), with there being a weak correlation (contingency coefficient = 0.167). Of those who responded (n = 8,268), 12.5% of had private health insurance coverage. The least number of rural women had health insurance coverage (7%) compared to 16.5% of peri-urban women and 18.7% of urban women.

Table 4 revealed that there was a negative statistical correlation between self-reported good health status and age group ($\chi^2 = 820.397$, $P < 0.001$), with the association

being a moderate one (cc = 0.301). The findings indicated that 7.5% of young respondents reported a poor health status compared to 15.6% other adults and 40.9% of elderly respondents indicating the substantial erosion of good health status of women as they age.

Of the 1,417 respondents who reported an illness, 7.0% indicated that it was diagnosed as chronic recurring illness. A statistical correlation was found between illness being recurring and age group of respondents ($\chi^2 = 413.247$, $P < 0.001$), with relationship between the two aforementioned

variables being a moderate one (cc = 0.473). Based on Table 5, Diabetes mellitus, hypertension and arthritis were found to be more an elderly chronic illness than the other age sub-samples. Simply put, as women age, chronic illness such as diabetes mellitus, hypertension and arthritis increased, with arthritis having the greatest increase in elderly compared to middle age.

Table 2 Average consumption per person per household by per capita income quintile

	Number	Mean	Std. Deviation	Std. Error	95% CI	
					Lower	Upper
		US$	US$	US$	US$	US$
Poorest 20%	1492	225.38	64.03	1.66	222.13	228.63
Poor	1631	376.37	45.66	1.13	374.15	378.59
Middle class	1669	525.07	70.19	1.72	521.7	528.44
Wealthy	1816	759.91	123.34	2.89	754.24	765.59
Wealthiest 20%	1933	1709.65	1550.86	35.27	1640.47	1778.83
Total	8541	762.35	917.81	9.93	742.88	781.82

F statistic = US$22.32, P < 0.001; Rate in 2002 was US$1 = JA$50.

When a correlation was performed between the duration of illness (How long did the last episode of illness last?) and area of residence, a relationship was found between the two variables (F = 7.513, P < 0.001). On an average, the mean duration for the illness was 11.09 days (SD 10.742 days), 95% CI: 10.51-11.67 days. Rural residents reported suffering from illness for a mean of 11.74 days (SD 10.691 days), 95% CI: 11.04-12.44 days which was not statistically different from mean number of days reported by peri-urban residents, 10.50 days (SD 10.573 days), 95% CI: 9.21-11.79 days, $P < 0.001$. The mean number of reported days in which rural and urban resident were ill [8.20 days (SD 10.879 days), 95% CI: 6.44-9.96 days, $P = 0.233$]. There was no statistical difference between the mean duration of illness for peri-urban and urban residents, $P = 0.091$.

The findings revealed that health status by area of residence had no statistical correlation, $P= 0.051$ (Table 6). Despite the no statistical difference, in excess of 30.0% in each area of residence suffered from hypertension, 16% from diabetes mellitus, 13% other and 5% arthritis. Of the 1,434 respondents who indicated poor health status, 93.0% said that these were diagnosed as recurring and acute.

Table 3 Health insurance, self-reported good health status by area of residence (in %)

	Area of Residence		
Details	Rural	Peri-urban	Urban
	n = 4796	n = 2216	n = 1263
Health insurance			
Yes	7.0	16.5	18.7
No	93.0	83.5	81.3
Self-reported visits to public facilities for health care			
Yes	7.1	4.4	6.1
No	92.9	95.6	93.9
Self-reported visits to private facilities for health care			
Yes	0.3	0.0	0.0
No	99.7	100.0	100.0

Health insurance - *P*< 0.001; Self-reported visits to public health care facilities (*P* < 0.386); Self-reported visits to private health care facilities (*P* < 0.617)

Multivariate Analyses
Of the 20 predisposed variables that were used in the used in Eq. [2], one was excluded because the correlation coefficient between it (consumption) and income was 0.68. Nine variables were found to be determinants of good health status of women in Jamaica (Table 7). The model had a statistical significant predictive power (χ^2 = 1,249.19 $P < 0.001$; Hosmer and Lemeshow goodness of fit χ^2 = 5.606, $P = 0.691$). In addition, it was revealed that overall 84.9% (n = 7,251) of the data were correctly classified: 97.7% of those who indicated good health status and 37.8% of those who indicated poor health status.

Table 4 Self-reported good health status by age group.

Good health status	Age group		
	Young (n:3,114)	OtherAdults (n: 3,579)	Elderly (n:1,544)
No	234 (7.5)	558 (15.6)	631(40.9)
Yes	2,880(92.5)	3,021(84.4)	913(59.1)

χ^2 = 413.247, P< 0.001

On examination of data (Table 7), it was revealed that private health insurance was the most significant factor predicting good health status of women in Jamaica (OR = 27.5, 95% CI = 21.1-35.8)followed by assets owned (OR = 1.1; 95% CI = 1.0-1.0); age of the respondents (OR = 0.9, 95% CI = 0.9-0.9); positive affective psychological status (OR = 1.1, 95%CI = 1.0-1.1); number of men in the household (OR = 0.9, 95% CI = 0.8-1.0); income (OR = 1.000, 95% CI = 1.000-1.000); marital status – married – (OR = 1.2, 95% CI = = 1.1-1.6); crowding (OR = 0.9, 95%CI = 0.8-1.0); area of residence and negative affective psychological status (OR = 1.0, 95% CI = 0.9-1.0). All the factors explain 36.0% of the variability in health status of women in Jamaica. Income positively influences good health status of women (OR = 1.0, 95%CI 1.0-1.0) (Table 7).

The current work has found that women who have health insurance were 27.5 times likely to report good health than those who do not have health insurance coverage. Rural women were less likely to report good health status compared to urban women; and that peri-urban women were 1.1 times more likely to report good health status compared to urban women. Married women were 1.2 times more likely to report good health status with reference to those who were never married. Women who were experiencing greater positive affective psychological conditions were 1.1 times more likely to report good health status; and women who experienced greater negative affective psychological conditions were 0.03 times less likely to report good health status. The older women get, they are 0.19 times less likely to report good health status (Table 7).

Using a sub-sample of 4,962 rural residents, 20 initial predisposed explanatory variables were tested to ascertain factors and degree of significance of each factor (P < 0.05), one was omitted (consumption, because the correlation coefficient between it and income was 0.68). Of the 19 predisposed variables that were examined in the initial model, nine of them explained 38.6% of the variability in health status of rural women in Jamaica (Table 8).

The model had a statistical significant predictive power (χ^2 = 884.476 P < 0.001; Hosmer and Lemeshow goodness of fit χ^2 = 8.498, P = 0.386). Overall, 84% (n = 2,940) of the data were correctly classified: 96.8% (n = 2,593) of those who had indicated good health status and 42.3% (n = 347) of those with poor health status.

Continuing, Table 8 revealed that health insurance was the most influential factor determining the good health status of rural women in Jamaica (OR = 25.0, 95% CI =18.0-34.9) followed by assets owned (OR = 1.0, 95% CI = 1.0-1.1); age (OR = 0.9, 95% CI = 0.8-0.9); number of men in household (OR = 0.8, 95% CI = 0.7-0.9); positive affective psychological status (OR = 1.1, 95% CI = 1.0-1.1); educational attainment – secondary and post-secondary level education (OR = 1.4, 95% CI = 1.1-1.8); Social support (OR = 1.3, 95% CI = 1.1-1.6); marital status – married (OR = 1.4, 95% CI = 0.8-2.3), and lastly income (OR = 1.0, 95% CI = 1.0-1.0).

The current findings revealed that income plays the least role in determining good health status of rural women; women with health insurance are 25.0 times more likely to have good health status than those without health insurance coverage; married rural women are 1.4 times more likely to report good health status with reference with those who were never married; those rural women with social support were 1.3 times more likely to report good health status compared to those who did not have social support, and as rural women become older, they are 0.102 times less likely to report good health status. More males in the household will reduced the good health status of rural women (OR = 0.83, 95% CI = 0.75-0.93): indicating that more males in a household will decrease rural women's good health status by 0.17 times compared to less males in the household.

With regard to peri-urban areas in Jamaica, a sub-sample of 2,283 respondents were used to establish the good health status model. This model had a statistical significant predictive power (χ^2 = 285.807 P < 0.001; Hosmer and Lemeshow goodness of fit χ^2 = 7.226, P= 0.512). Upon reviewing the classification table, overall, 88.2% of the data were correctly classified: 98.8% of those classified as having had good health status and 35.5% of those who had indicated poor health status (Table 9).

Of the 19 predisposed variables that were tested in the initial model, six factors accounted for 36.6% of the variability in good health status of women in peri-urban area in Jamaica (Table 9). The factors that predict good health status of peri-urban Jamaican women in descending order were health insurance (OR=57.7; 95%CI: 29.8-111.7); asset ownership (OR=1.0; 95%CI: 1.0-1.0); age of respondents (OR=0.9; 95%CI: 0.9-1.0); number of men in household (OR=0.8; 95%CI: 0.6-1.0); negative affective psychological status (OR=0.9; 95%CI: 0.9-1.0); positive affective psychological status (OR=1.1; 95%CI: 1.0-1.1) and consumption (OR=1.0; 95%CI: 1.0-1.0).

Table 5 Diagnosed with recurring illness by age group

Diagnosed/recurring illness	Age Group			Total
	Young (n = 236)	Middle (n = 562)	Elderly (n = 636)	(n = 1,434)
Cold	64 (27.1)	62(11.1)	21 (3.3)	
Diarrhea	9 (3.8)	10 (1.8)	7 (1.1)	26 (1.8)
Asthma	37 (15.7)	33 (5.9)	12 (1.9)	82 (5.7)
Diabetes	5 (2.1)	82 (14.6)	150 (23.6)	237 (16.5)
Hypertension	17 (7.2)	206 (36.7)	275 (43.2)	498 (34.7)
Arthritis	3 (1.3)	20 (3.6)	91 (14.3)	113 (7.9)
Other	65 (27.5)	99 (17.6)	65 (10.2)	229 (16.0)
No	36 (15.3)	49 (8.7)	15 (2.4)	100 (7.0)

$\chi^2 = 413.247$, $P < 0.001$, cc = 0.473

Table 6 Diagnosed/recurring illness by area of residence.

Diagnosed/recurring illness	Area of Residence			Total
	Rural Areas (n = 961)	Peri-urban (n = 292)	Urban (n = 636)	(n = 1,434)
Cold	98 (10.2)	27(9.2)	23(12.7)	148(10.3)
Diarrhea	57(5.9)	10(3.4)	4(2.2)	26(1.8)
Asthma	57(5.9)	13(4.5)	12(6.6)	82(5.7)
Diabetes	159(16.5)	49(16.8)	29(16.0)	237(16.5)
Hypertension	342(35.6)	95(32.5)	61(33.7)	498(34.7)
Arthritis	82(8.5)	17(5.8)	15(8.3)	114(7.9)
Other	157(16.3)	47(16.1)	25(13.8)	229(16.0)
No	54(5.6)	34(11.6)	12(6.6)	100 (7.0)

No significant association ($P > 0.05$).

The findings revealed that income contributed the least to good health status of peri-urban residents. Another interesting finding of the current study is peri-urban women who had health insurance coverage is 57.7 times more likely to report good health status compared another who do not have this coverage. The older peri-urban women get, they are 0.1 times less likely to record good health; more men contributes 0.2 times less to their good health; the more asset they own this increased their good health by 1.0 times more another with less assets and that the more they are positive, this direct increase their good health status and the converse is the case for those with greater scores in negative affective psychological conditions.

A sub-sample of 1,296 women of urban Jamaica was used to build the good health status model. The model had a statistical significant predictive power (model chi-square = 263.08 P < 0.001; Hosmer and Lemeshow goodness of fit $\chi^2 = 8.481$, $P = 0.388$). Upon observation of classification, overall, 83.4% of the data were correctly classified: 97.1% of those who had indicated good health status and 31.8% of those who reported poor health status.

Of the 19 predisposed variables that were examine in the initial model, six of them accounted for 30.7% of the variability in good health status of urban women in Jamaica (Table 10). Health insurance had the most impact on good health status of urban women (OR = 22.2; 95%CI: 11.3-43.7) followed by in descending order are age of respondents (OR = 0.94; 95% CI= 0.9-1.0); two wealthiest quintiles (OR = 1.8; 95%CI: 1.1-2.9); asset ownership (OR=1.0; 95%CI: 1.0-1.0); positive affective psychological status (OR = 1.1; 95%CI: 1.0-1.1) and number of men in the household (OR = 1.2; 95%CI: 1.0-1.5).

Embedded in the current findings are that urban women with health insurance coverage were 22.2 times more likely to record good health status compared to those who do not have health insurance coverage; the older urban women get, they are 0.1 times less likely to record good health status and that more men in urban household contributed 1.2 times more likely to good health status. Concomitantly, urban women in the two wealthiest quintiles were 1.8 times more likely to report good health status with reference to women in the poor-to-poorest 20%.

Table 7 Logistic regression of the general good health status of Jamaican women by some explanatory variables, n = 8,541

Explanatory Variables	Std. Error	Odds Ratio	95% CI
Two wealthiest quintiles	0.102	1.136	0.931 - 1.387
Household Head	0.288	0.891	0.507 - 1.566
Log medical Expenditure	0.027	1.003	0.951 - 1.059
Separated, Divorced , Widowed	0.131	1.231	0.952 - 1.591
Married	0.095	1.247	1.036 - 1.501*
†Never married		1.000	
Rural	0.096	0.819	0.679 - 0.989*
Peri-Urban	0.115	1.054	0.842 - 1.320*
† Urban		1.000	
Secondary level	0.104	1.084	0.883 - 1.330
Tertiary level	0.183	1.168	0.817 - 1.671
†Primary and below level			
Social support	0.077	1.123	0.965 - 1.306
Crowding	0.045	0.907	0.831 - 0.991*
Psychological conditions			
Positive Affective	0.012	1.055	1.030 - 1.080***
Negative Affective	0.017	0.966	0.935 - 0.998*
No. of males in household	0.044	0.887	0.814 - 0.966**
No. of females in household	0.042	0.965	0.889 - 1.048
No. of children in household	0.033	0.989	0.928 - 1.055
Age	0.018	0.910	0.878 - 0.943***
Asset owned	0.003	1.035	1.029 - 1.041***
Health Insurance	0.134	27.478	21.111 - 35.765***
Living Arrangement	0.179	0.879	0.619 - 1.248
Physical Environment	0.112	0.945	0.759 - 1.177
Average Income	0.000	1.000	1.000 - 1.000**
Crime Index	0.004	1.008	0.999 - 1.017
Constant	0.417	0.063	-

Nagelkerke R-square = 36.0%; -2 Log likelihood= 4656.637; Hosmer and Lemeshow chi-square=5.606; P=0.691; Model: Omnibus Test - chi-square=1,249.19, P < 0.001; Overall correct classification = 84.9%; Correct classification of cases of poor health status = 37.8%; Correct classification of cases of good health status = 97.1%; †Reference group; *P< 0.05. **P < 0.01, ***P < 0.001.

Discussion

The findings of the current study showed that poverty for rural women was 2.4 times more than that for urban women and 1.9 times more than that for peri-urban women. An interesting finding is that on average urban women received income which was 1.6 times more than rural women and 1.2 times that of peri-urban women. Rural women's consumption expenditure was 45% less than that for urban women and 31% less than for peri-urban women. Another fundamental disparity was in education as 161 rural women for every 100 urban women had at most primary education and the ratio was 127 to 100 rural women for every peri-urban woman respectively. Those socioeconomic disparities between sub-regions in Jamaica, accounted for rural women having the lowest good health status. Overall, Jamaican women report good health status (over 80%). Those with poor health status were more likely to report having hypertension followed by diabetes mellitus, and the rates of these two chronic diseases were similar in the three geographical locations. Hypertension (43.2%) and diabetes mellitus (23.6%) was more prevalent in the elderly than in the other adult and young respondents. Interestingly, only 7.5% elderly had private health insurance coverage and the mean consumption expenditure for the poorest was 13% of that for those in the wealthiest income group, supporting the that poverty was a rural phenomenon and that this significantly retards consumption pattern of rural women in Jamaica. A critical finding of this study was that health insurance coverage accounted for the most influence on good health status of women in the 3 sub-regions; but that it had the most impact on good health for peri-urban women and the least for urban women. Another important finding was that income played a secondary role to factors such as health insurance, age of respondents and other psychosocial factors. Education did not explain good health status for peri-urban or urban women; and that more males contributed positively to the health status of urban women and negatively for women in the two other sub-regions.

Table 8 Logistic regression of the good health status of rural-Jamaican women by some explanatory variables, (n: 3,498).

Explanatory variables	Std. Error	Odds Ratio	95% CI
Two wealthiest quintiles	0.142	1.043	0.790 - 1.378
Household Head	0.385	0.512	0.241 - 1.087
Log medical Expenditure	0.035	1.040	0.971 - 1.114
Separated, divorced	0.169	1.309	0.940 - 1.822
Married	0.121	1.360	1.074 - 1.724*
†Never married		1.000	
Secondary or post-secondary	0.132	1.413	1.090 - 1.832**
Tertiary level	0.271	1.352	0.795 - 2.298
†Primary and below		1.000	
Social support	0.100	1.292	1.063 - 1.571*
Crowding	0.058	0.961	0.858 - 1.075
Psychological conditions Positive Affective	0.017	1.053	1.019 - 1.087**
Negative Affective	0.021	0.964	0.924 - 1.005
Number of males in house	0.058	0.834	0.745 - 0.933**
Number of females in house	0.056	0.899	0.805 - 1.003
Number of children in house	0.043	0.950	0.873 - 1.033
Age	0.025	0.898	0.855 - 0.942***
Assets owned	0.004	1.038	1.031 - 1.046***
Health Insurance	0.167	24.955	18.006 - 34.586***
Living Arrangement	0.248	0.770	0.474 - 1.252
Physical Environment	0.127	0.922	0.718 - 1.183
Average Income	0.000	1.000	1.000 - 1.000**
Crime Index	0.007	1.005	0.991 - 1.018
Constant	0.541	0.069	-

Nagelkerke R-squared = 38.6%; 2 Log likelihood=2,774.82; Hosmer and Lemeshow chi-square = 8.498; P=0.386; Model: Omnibus Test - chi-square=884.476, $P < 0.001$; Overall correct classification = 84%; Correct classification of cases of poor health status =42.3%; Correct classification of cases of good health status = 96.8%; †Reference group; $*P < 0.05$. $**P < 0.01$, $***P < 0.001$.

Table 9 Logistic regression of the good health status of peri-urban-Jamaican women by some explanatory variables, n=2,283

Explanatory variables	Std. Error	Odds Ratio	95% CI
Two wealthiest quintiles	0.220	0.949	0.616 - 1.461
Household Head	0.722	2.554	0.620 - 10.523
Log medical Expenditure	0.058	0.953	0.851 - 1.068
Average Income	0.000	1.000	1.000 - 1.000
Separated, divorced, widow	0.291	0.853	0.482 - 1.510
Married	0.203	1.143	0.767 - 1.704
†Never married		1.000	
Secondary or post-secondary	0.235	0.704	0.444 - 1.115
Tertiary level	0.367	0.622	0.303 - 1.277
†Primary and below		1.000	
Social support	0.169	0.849	0.609 - 1.182
Crowding	0.095	0.874	0.726 - 1.051
Psychological conditions Positive Affective	0.027	1.062	1.008 - 1.120*
Negative Affective	0.037	0.923	0.859 - 0.992*
Number of males in house	0.105	0.780	0.634 - 0.959*
Number of females in house	0.103	0.961	0.786 - 1.175
Number of children in house	0.074	0.958	0.829 - 1.107
Age	0.038	0.935	0.867 - 1.008***
Assets owned	0.006	1.031	1.018 - 1.044***
Health Insurance	0.337	57.659	29.785 - 111.619***
Living Arrangement	0.363	0.919	0.451 - 1.870
Physical Environment	0.286	0.961	0.549 - 1.683
Crime Index	0.009	1.005	0.988 - 1.023
Constant	0.999	0.065	-

Nagelkerke R-square=36.6%; -2 Log likelihood = 1,071.43; Hosmer and Lemeshow chi-square=7.226; P=0.512; Model: Omnibus Test - chi-square=285.807, P < 0.001; Overall correct classification = 88.2%; Correct classification of cases of poor health status =35.5%; Correct classification of cases of good health status = 98.8%; †Reference group; *P < 0.05. **P < 0.01, ***P < 0.001.

Table 10 Logistic regression of the good health status of urban-Jamaican women by some explanatory variables, n = 1,296

Explanatory variables	Std. Error	Odds Ratio	95 % CI
Two wealthiest quintiles	0.247	1.808	1.113 - 2.935*
Household Head	0.602	1.044	0.321 - 3.399
Log Medical Expenditure	0.074	0.960	0.830 - 1.110
Average Consumption	0.000	1.000	1.000 - 1.000
Separated, divorced, widowed	0.327	1.541	0.812 - 2.923
Married	0.251	1.154	0.706 - 1.886
†Never married		1.000	
Secondary or post-secondary	0.279	0.714	0.413 - 1.234
Tertiary level	0.400	1.147	0.524 - 2.509
†Primary and below		1.000	
Social Support	0.200	0.911	0.616 - 1.346
Crowding	0.116	0.829	0.661 - 1.040
Psychological conditions			
Positive Affective	0.027	1.066	1.010 - 1.124*
Negative Affective	0.043	1.019	0.937 - 1.108
Number of males in house	0.106	1.237	1.005 - 1.522*
Number of females in house	0.096	1.163	0.964 - 1.405
Number of children in house	0.092	1.127	0.941 - 1.349
Age	0.044	0.936	0.858 - 1.021***
Assets owned	0.007	1.028	1.013 - 1.043***
Health Insurance	0.345	22.222	11.312 - 43.655***
Living arrangement	0.390	1.475	0.687 - 3.167
Environment	0.482	1.722	0.669 - 4.431
Crime Index	0.010	1.008	0.988 - 1.027
Constant	1.029	0.043	-

Nagelkerke R-square=41.5%; -2 Log likelihood = 738.894; Hosmer and Lemeshow chi-square=8.481; P=0.388; Model: Omnibus Test - chi-square=263.08, P <0.001; Overall correct classification = 82.9%; Correct classification of cases of poor health status =37.0%; Correct classification of cases of good health status = 97.3%; †Reference group; *P < 0.05. **P < 0.01, ***P < 0.001.

When health status of Jamaican women was deconstructed into area of residence, some major similarities were observed among them. The study revealed that the most significant factor predicting health status of women in Jamaica across the three sub-regions was health insurance coverage. Embedded in this study is the fact that health insurance aids in the health care-seeking behavior of women; but that it is more so for peri-urban women. For peri-urban women, those with health insurance coverage were approximately 60 times more likely to report good health status than those without this coverage, suggesting that lifestyle practices of these women account for their health status. This finding can be supported by the fact that women in peri-urban zones visited health care practitioners more than that of rural but less than urban women.

Financial resource availability plays an important role in health care decisions. The resources regarding health care decision-making could be health insurance or monetary resources. Health insurance is important for access to health care and being uninsured significantly reduces access to health services and substantially increases health problems. Uninsured persons with poor health status are much more likely than their insured counterparts to report that they or a family member did not receive doctor's care or prescription medicines [23]. Shi [24] reported that income was the most significant predictor of lack of health insurance coverage, which explains why rural women in this study had the least health insurance coverage, the lowest income and consumption and the lowest good health status. Low-income adult women tended to have lower health status and uninsured women tended to have problems accessing health care services [25], which are concurred by this study. Mead et al [26] noted that low-income women were less likely to have health insurance, while they were more likely to have health care access problems, chronic illness and lower overall health status than their richer counterparts.

In Jamaica, Life of Jamaica and Blue Cross Jamaica Limited are the only total health insurance companies catering to the widest cross- section of Jamaica's population. These companies offer a wide range of health insurance products to best suit the needs of clients from individuals, students, executives, associations and

companies. This study revealed that an overall 11 out of every 100 of sample had health insurance coverage. In terms of geographical areas, 7 out of every 100 rural women, 17 out of every 100 peri-urban women and 19 out of every 100 urban women possessed health insurance coverage, which reinforced the aforementioned findings that income plays a critical role in health insurance coverage and health status. These results are not in agreement with findings from a study by Wong and Diaz [27], who found that almost three-quarters of the urban population (73%) have coverage compared to 38% of those in rural areas; women showed a slightly higher and similar coverage (56%) than men (52%). Bennett et al. [28] postulated that rural residents were more likely to be uninsured than urban residents (17.8% versus 15.3%), and that rural respondents were more likely than urban counterparts to report having deferred health care because of cost (15.1% versus 13.1%). In studies done in rural areas, the probability of a worker being covered by an employer-sponsored insurance plan is lower than for urban workers [29, 30]; and therefore account for the health insurance disparity between the 3 sub-regions. The authors found that small firm size and low wages in rural areas are the main reasons for this difference. In this study 7.5% of women residents in all three regions reported having health insurance coverage, which is similar to 7.6% reported in a previous study [31]. Hence this justifies why rural women recorded the least number of visits to health care practitioners; because health care cost will be substantially an out of pocket expense that they would be unable to afford.

Good health is a determinant of the individual and societal economic status. Unemployed women were reported to have poorer mental and physical health status than employed women [32, 33]. This causes low-income women to frequently face health care decisions. However, low-income women often experience conflicts between their poor health status and lack of resources. Wagstaff and Doorslaer [34] reported that an individual's absolute income affected his/her mortality. These authors supported Rodgers' [35] argument that the relationship between an individual's health and income is concave. This means that each additional dollar of income raises an individual's health status, but the increase gets smaller as income increases and justifies why income plays a secondary role to health insurance coverage. Another fact that this study highlights is the increased indirect role that income plays, which is weaker than it direct role.

Poverty is related to poor health, and urban poverty is a dynamic status. An individual or household's position can decline or improve over short periods according to changing circumstances such as illness, unemployment, eviction or other events. The causes of urban poverty are interlinked, stemming from such factors as employment insecurity, sub-standard housing, poor health, low levels of income generation, vulnerability to market shocks, and limited education [36-39]. According to Hinrichson [40], most urban poverty does not result from a lack of jobs, but from a lack of well-paying, steady jobs. Unemployment

rates are generally below 15% in most developing country cities, but wage rates are depressed in the formal sector, and many are self-employed in the informal sector. Average incomes in rural areas are often lower than in urban areas [41, 42]. In rural areas, poverty leads to health-related problems not only for single mothers but also for mothers with partners, while in urban areas this problem is usually observed in single mother-headed households. Rural Americans are more likely to be poorer [43] and less healthy than their urban counterparts, which is also the case in Jamaica. This study goes farther as it found that urban women in the two wealthy quintiles were 1.8 times more likely to report good health, and this was not the case for rural or peri-urban women. Although social class (i.e. wealthy class) is a predictor of good health status of urban women, once again peri-urban women had the greatest good health status. This indicates that after certain sum of wealth, income adds increasing less to good health status. Income therefore will add substantially more to the good health status of poor women than it is likely to increase good health for middle and wealthy women's health status.

Non-communicable diseases such as cardiovascular diseases, cancer, chronic respiratory diseases and diabetes mellitus are rapidly increasing problems for the socially disadvantaged [44]. In this study, findings of diagnosed chronic health conditions show patterns of worse health status among elderly women living in rural areas. The prevalence of hypertension and diabetes mellitus among respondents in the three regions were similar. However, reports of cancer, influenza, asthma and arthritis are low compared with hypertension and diabetes mellitus. Hypertension was higher in rural than urban and peri-urban areas. The self-report of disability and chronic status is higher for older than younger residents. Rural women tend to have higher rates of chronic status of hypertension, arthritis, spinal disorders, bursitis, hearing, and visual impairments than their urban counterparts. They also make fewer doctor visits than urban women. Furthermore, when seeking medical services, they are more likely to be ill, hospitalized than women in urban areas [45]. In this study, the duration of sickness in women residents in rural areas was longer than their counterparts in urban and peri-urban areas. In addition, health care facilities in rural areas are unfavorable compared to non-rural areas due to limited medical resources and shortage of physicians [46]. We can deduce from current study that with rural women having less economic resources and lowered visits to health care facilities, they would be using more home remedy or non-traditional healers to treat their ill-health. Hence this would account for an aspect of pre-mature mortality of these women.

In this study a higher percentages of the elderly in the rural areas reported poor health status. Bennett et al. [28] found that residents in rural area were more likely to report fair to poor health status than were residents of urban counties (19.5% versus 15.6%). Rural adults were more likely to report having diabetes mellitus than were urban adults (9.6% versus 8.4%). The authors also found that urban

residents are more likely to use preventative care than their rural counterparts, but there seemed to be no differential use of doctor visits or hospitalizations [28]. According to Brenzel et al. [47] chronic diseases such as diabetes mellitus and hypertension are either undetected or medically untreated, or in the case of those who do receive treatment, the clinical management of the status is poor. In Jamaica, available hospital records show that between 1990 and 98 showed that twice as many women than men were admitted for hypertension and diabetes mellitus [48]. The predominance of women with chronic disease visiting health care facilities (82%) is in keeping with the experience of other public health areas for chronic diseases. In addition, women are more likely to report an illness; with 15% women compared to 12% men reported suffering from an illness or injury in the previous four weeks in 1991. The gender gap is widest for hypertension with twice as many women as men (12% vs. 6%) reporting having the disease [47]. In the current study, the researchers found that diabetes mellitus for elderly women was 11.2 times more than that for young women and 1.6 times more than for middle aged adult women. Continuing, hypertension in elderly women was 6.0 times more than that in young women and 1.2 times more than in middle aged adults. Arthritis was 10.8 times more in elderly women compared to young women and 4.0 times more in elderly than in middle aged adult women. On the other hand, acute dysfunctions such as cold, diarrhea and asthma decreases as women become older and the same was recorded for unspecified illness.

Women's education also affects attitudes toward health. The more highly educated are likely to better understand the importance of proper health care. Ross and Miroswky [49] reported that education significantly improved self-reported health and physical functioning. In addition, knowledge of and experiences with health care were found to affect an individual's health care behavior more so than age. The latter was believed to be the most dominant determinant of health care behavior [50]. Majority of the women residents in this study attained secondary level education. Education is strongly associated with the level of health service utilization, the type of provider, the choice of private versus public provider, dietary and child-feeding, and sanitary practices [51]. However, studies have found that it is not just general education, but also health-specific knowledge that is important. Barrera [52] and Caldwell [53,54] argued that educated mothers are more likely than the uneducated ones to take advantage of modern medicine and comply with recommended treatments because education changes the mother's knowledge and perception of the importance of modern medicine in the care of her children. In contrast, Rosenzweig and Schultz [55] viewed women schooling and health care services as partial substitutes for information regarding knowledge of diseases, treatment of illness and child-care practices, and hypothesized that the effect of education on child health becomes less important as access to public health care services improves. Presumably, in areas where such services are readily accessible, they are used by both educated and uneducated

women, and thus the advantage conferred by schooling on health outcomes is narrowed. It is unlikely that the observed effects of maternal education on child-health outcomes simply reflects health knowledge and habits acquired in school, although they may play some role [56]. Education could thus influence a woman's beliefs about disease causation and cure and the value she places on modern medicine. Mansfield et al. [57] compared the health practices of rural women with those of a large metropolitan area. They found that rural women adopted more health practices overall than their urban counterparts, and younger women in both groups exhibited more awareness of health promotion. In addition, they found that there is higher utilization of doctors' visits and preventative care among persons with the highest level of education and in the highest income groups. However, higher education or income seems to have no association with differential use of hospitalizations [57]. The current study both concurs and disagrees with the aforementioned works. Education was not found to be significantly correlated with good health status of Jamaican women. However, this was not the case for rural women. An irony that lies in this study is the fact that there is a health disparity between women who have had a most primary education compared to those with secondary education, but there was none between tertiary and at most primary education for rural women.

Human emotions are a mix of not only positive status but also negative factors [58]. Hence, depression, anxiety, neuroticism and pessimism are seen as measures of the negative psychological status that affect subjective wellbeing [59, 60]. Negative psychological status (loss of family members, friends etc) affect subjective wellbeing in a negative manner (guilt, fear, anger, disgust [60, 61] and that the positive factors influence self-reported wellbeing in a direct way. This was concurred in a study conducted by Fromson et al [62] and other researchers [59, 63]. In this study, negative affective psychological status was inversely affect good health status of Jamaican women, and the opposite was true for positive affective psychological conditions. On disaggregating the good health status by the 3 sub-regions, only positive affective conditions influence good health status of urban women while positive and negative affective psychological conditions determined good health status for rural and peri-urban women. Rural residents are more likely than their urban counterparts to experience negative circumstances such as unemployment, lower rate of health insurance coverage, poor health status, and lowered consumption and earnings and this retards their health care seeking behaviors and further becomes challenges for their health. Hambleton et al. [20] found that an individual's psychological state influences his/her health status, which this study concurs with. People in rural areas are more likely to have characteristics that are strongly associated with depression, poor health status, chronic diseases and poverty. Probost et al. [64] found the prevalence of depression were slightly higher in residents in rural than in urban areas. Depression is subsumed in negative affective psychological condition, and so this work agrees with the

literature. The current study however found that there is no significant statistical difference between the negative psychological state of peri-urban and urban women in Jamaica as well as between positive affective psychological conditions and urban and urban women. Embedded in these findings are the higher over affective conditions of peri-urban women, and this fact accounts for peri-urban women having the greatest health status.

Some limitations must be considered in interpreting these results as this study was completely based on data reported by interviewed residents, and of course, persons do not always answer factually in interview surveys. Therefore, survey participants could be subject to recall bias in their health status. Interviewers and supervisory staff were aware of this problem, and interviewer instructions included directions for probing participants on these issues. However, the strength of the study's sample design and data collection procedures compensated for these limitations.

Conclusions

The findings revealed that rural women had the least good health, while peri-urban women recorded the greatest self-reported good health. Concurrently, rural women were older; poorer; received the lowest income per person; had the greatest percentage of primary level education; recorded the highest negative affective psychological conditions; were the least likely to have health insurance coverage and they recorded the lowest consumption expenditure. This study therefore provides a comprehensive understanding of health of women in Jamaica and the 3 sub-regions as well as the disparity in socio-demographic correlates of health based on the different geographical regions. Concomitantly, poverty continues to reduce the self-rated health status of women and while they are living 6 years longer than men, this does not mean that we neglect the reality that poverty is eroding their health status.

Acknowledgement

References

1. United Nations Department of Economic and Social Affairs, Population Division 5. World Urbanization Prospects: The 2007 Revision. Washington DC: UN; 2007.
2. Bourne, P. Growing old in Jamaica: Population ageing and senior citizens' wellbeing. Kingston: Department of Community Health and Psychiatry, Faculty of Medical Sciences, the University of the West Indies, Mona, Jamaica; 2009.
3. Bourne, P. Determinants of well-being of the Jamaican elderly. The University of the West Indies, Mona Campus; 2007.
4. Eldemire, D. A situational analysis of the Jamaica elderly, 1992. Kingston: Planning Institute of Jamaica; 1995.
5. Planning Institute of Jamaica, PIOJ, Statistical Institute of Jamaica, STATIN. Jamaica Survey of Living of Jamaica, 2007. PIOJ, STATIN; 2008.
6. Cohen M. Towards a framework for women's health. Patient Education and Counseling 1998, 33: 187-196.
7. Bourne PA. Quality of life of Jamaican women. West Indian Medical Journal 2008, 57 :(suppl 4): 49.
8. Eldemire D. Older women: A situational analysis, Jamaica 1996. New York: United Nations Division for the Advancement of Women; 1996.
9. Bailey, B. The search for gender equity and empowerment of Caribbean women: The role of education. In: Nain GT, Bailey B, editors. Gender equality in the Caribbean: Reality or Illusion. Kingston: Ian Randle Publishers, Jamaica, 2003: p. 108-144.
10. Bailey B, Rickets H. Gender vulnerabilities in Caribbean labour market. Social and Economic Studies 2003, 52: 49-81.
11. Seguino S. Why are women in the Caribbean so much more likely than men to be unemployed? Social and Economic Studies 2003, 52: 83-120.
12. Thorson. A.; Hoa, N.; Long, N. Health-seeking behaviour of individuals with a cough of more than 3 weeks. The Lancet 2004, 356: 1823-1824.
13. Planning Institute of Jamaica, [PIOJ], Statistical Institute of Jamaica, [STATIN]. Jamaica Survey of Living Conditions, 1990-2006. Kingston; PIOJ, STATIN; 1991-2007.
14. Grossman M. The demand for health - a theoretical and empirical investigation. New York: National Bureau of Economic Research; 1972.
15. Bourne PA. Health determinants: Using secondary data to model predictors of well-being of Jamaicans. West Indian Medical Journal 2008, 57: 476-481.
16. Planning Institute of Jamaica and Statistical Institute of Jamaica (PIOJ & STATIN). Jamaica Survey of Living Conditions 2002. Kingston: PIOJ, STATIN; 2003.
17. Homer D, Lemeshow S. Applied logistic regression, 2nd edn. John Wiley & Sons Inc., New York; 2000.
18. Cohen L, Holliday M. Statistics for Social Sciences. London, England: Harper and Row; 1982.
19. Bourne PA. Health Determinants: Using Secondary Data to Model Predictors of Wellbeing of Jamaicans. West Indian Medical Journal 2008, 57: 476-481.
20. Hambleton IR, Clarke K, Broome HL, Fraser HS, Brathwaite F, Hennis AJ. Historical and current predictors of self-reported health status among elderly persons in Barbados. Rev Pan Salud Public 2005, 17: 342-352.
21. Bourne PA. Medical sociology: Modeling well-being for elderly people in Jamaica. West Indian Medical Journal 2008, 57: 596-604.

22. Bourne P. Using the bio-psychosocial model to evaluate the wellbeing of the Jamaican elderly. West Indian Medical Journal 2007, 56(suppl 3): 39-40.

23. Families, USA. The uninsured with chronic health conditions: Access to care in the western region, 2000. Retrieved on April 7, 2002 from http://www.familiesusa.org/media/pdf/factsheet.pdf

24. Shi L. The convergence of vulnerable characteristics and health insurance in the US. Social Science and Medicine 2001, 53:519-529.

25. Wyn R, Solis B. Women's health issues across the lifespan. Women's Health Issues 2001, 11: 148-159.

26. Mead H, Witkowski K, Gault B, Hartmann H. The influence of income, education, and work status on women's well being. Women's Health Issues 2001, 11: 160-172.

27. Wong R, Diaz J. Healthcare utilization among older Mexicans: health and socioeconomic inequalities. Salud Publica de Mexico 2007, 49: S505-S514.

28. Bennett K, Olatosi B, Probost J. Health disparities: A rural-urban chart book. Rural Health Research and Policy Centre; 2008.

29. Maine Rural Health Research Center. Small and rural: The double jeopardy in expanding employer-based health insurance coverage. Research & Policy Brief; 1994.

30. Maine Rural Health Research Center. Employer-based health insurance coverage of workers: Are rural firms and workers different? Research & Policy Brief; 1998.

31. Planning Institute of Jamaica, Statistical Institute of Jamaica. Jamaica Survey of Living Conditions 2002. Kingston; 2003.

32. Ross C, Mirowsky J, Goldsteen K. The impact of the family on health: The decade in review. Journal of Marriage and the Family 1990, 52:1059-1078.

33. Siefert K, Heflin C, Corcoran M. Food insufficiency and the physical and mental health of low-income women. Women and Health 2001, 32: 159-177.

34. Wagstaff A, Doorslaer E. Income inequality and health: What does the literature tell us? Annual Review of Public Health 2000, 21: 543-567.

35. Rodgers G. Income and inequality as determinants of mortality: An international cross-section analysis. Population Studies 1979, 33: 343-351.

36. Becker C, Hamer A, Morrison A. Beyond urban bias in Africa, Portsmouth, NH: Heinemann, 1994.

37. Amis P. Making sense of urban poverty. Environment and Urbanization 1995, 7: 145-157.

38. Moser C. Urban social policy and poverty reduction. Environment and Development 1995, 7: 159-171.

39. Wratten E. Conceptualizing urban poverty. Environment and Urbanization 1995, 7: 11-36.

40. Hinrichsen D, Salem R, Blackburn R. Meeting the urban challenge. Population Reports. Series M, No. 16. Baltimore: The Johns Hopkins Bloomberg School of Public Health, Population Information Program, 2002.

41. Montgomery M, Stren R, Cohen B, Reed H.E. Cities transformed; Demographic change and its implications in the Developing World. The National

Academy Press (North America)/Earthscan (Europe), Washington DC; 2003.

42. Montgomery M, Ezeh A. Urban health in developing countries: Insights from demographic theory and practice. In: S. Galea S, Vlahov D, eds. Handbook of Urban Health: Populations, Methods, and Practice. Springer, New York; 2005.

43. US Census Bureau. Poverty in the US, 1999. Current Population Reports, 2000.

44. WHO. The World Health Report 2000, health systems: improving performance, Geneva, WHO, 2000.

45. Bushy A. Health issues of women in rural environments: An overview. JAMA 1998, 53:53-56.

46. Ricketts T. The changing nature of rural health care. Annual Review of Public Health 2000, 21: 639-657.

47. Brenzel L, Henry-Lee A, Le Franc E. Gender and equity in access to health care in Jamaica and Barbados. Sir Arthur Lewis Institute of Social and Economic Studies, University of the West Indies, Submitted to The Pan American Health Organization, 12th October, 2001.

48. Ministry of Health and the Jamaica Cancer Registry. Annual Report. Ministry of Health, 2000.

49. Ross C, Mirowsky J. Does medical insurance contribute to socioeconomic differentials in health? The Milbank Quarterly 2000, 78: 291-321.

50. Rosen P, Anell A, Hjortsberg C. Patient views on choice and participation in primary health care. Health Policy 2001, 55: 121-128.

51. World Health Organization. Health Finances: A basic guide. WHO, Western Pacific Region, 2006.

52. Barrera A. The role of maternal schooling and its interaction with public health programs in child health production. Journal of Development Economics 1990, 32: 69-91.

53. Caldwell JC. Education as a factor in mortality decline: an examination of Nigerian data. Population Studies 1979, 33:395-413.

54. Caldwell JC. Cultural and social factors influencing mortality in developing countries. The Annals of the American Academy of Political and Social Science 1990, 510: 44-59.

55. Rosenzweig M, Schultz P. Market opportunities, genetic endowments, and intra-family resource distribution: Child survival in rural India. The American Economic Review 1982, 72: 803-815.

56. Lindenbaum S, Chakraborty M, Elias M. The influence of maternal education on infant and child mortality in Bangladesh. In: Caldwell JC, Santow G. editors. Selected Readings in the Cultural, Social and Behavioural Determinants of Health. Canberra: Health Transition Centre, The Australian National University, 1989: p.112–131.

57. Mansfield, P.; Preston, D.; Crawford, C. The health behaviors of rural women: Comparisons with an urban sample. Health Values 1989, (6), 12-19.

58. Watson D, Clark L, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS Scale. Journal of Personality and Social Psychology 1988, 54: 1063-1070.

59. Harris P, Lightsey O. Constructive thinking as a mediator of the relationship between extraversion, neuroticism, and subjective well-being. European Journal of Personality 2005, 19: 409-426.

60. Evans C, Sherer M, Nick T, Nakase-Thompson R, Yablon S. Early impaired self-awareness, depression, and subjective well-being following traumatic brain injury. Journal of Head Trauma Rehabilitation 2005, 20: 88-500.

61. Kashdan T. The assessment of subjective well-being (issues raised by the Oxford Happiness Questionnaire). Personality and Individual Differences 2004, 36: 1225-1232.

62. Fromson P. Self-discrepancies and negative affect: The moderating roles of private and public self-consciousness. Social Behavior and Personality 2006, 34: 333-350.

63. McCullough M, Bellah C, Kilpatrick S, Johnson JL. Vengefulness: Relationships with forgiveness, rumination, well-Being, and the big five. Personality and Social Psychology Bulletin 2001, 27: 601-610.

64. Probost J, Laditka S, Moore C, Harun N, Powell M, Baxley E. Rural-urban differences in depression prevalence: implications for family medicine. Public Health 2004, 95: 1695-1703.